U.S. Army Chemical Corps Research and Development Command
U. S. ARMY BIOLOGICAL WARFARE LABORATORIES
Fort Detrick, Frederick, Maryland

29 July 1959

Dr. Joshua Lederberg
Department of Genetics
University of Wisconsin
Madison 6, Wisconsin

Dear Dr. Lederberg:

Dr. Housewright has asked me to reply to your inquiry concerning the gradient column fractionation of bacteria.

The values for the density of moist and lyophilized Serratia marcescens communicated by G. W. Monk to Orr and Gordon, and quoted in their paper, were not actually obtained by a density gradient sedimentation method, although such a method might equally well have been used. As you will see from the enclosed excerpt from a report by Dr. Wagman, uniform mixtures of two organic liquids were prepared, and the proportions were adjusted until they became such that suspended bacteria remained motionless when centrifuged. The effect of the organic substances upon the viability of the bacteria was not determined.

You might care to write to Dr. Max Lauffer whose student Irwin Bendet has been studying the sedimentation of bacteria across a density boundary. They have been interested primarily in the question of hydration, but it is quite possible that the sort of procedure they are using might permit selection of cell fractions on the basis of small differences in rate of osmotic shrinkage. I have not thought enough about this to be quite certain whether or not it might be useful in connection with your problem. Dr. J. L. Oncley mentioned to me a month or two ago that in his laboratory simple and accurate methods have been developed for sampling the contents of density gradient columns at precisely defined levels; one method involves slicing of the column at the desired level, and the other involves some sort of siphoning procedure.

I imagine that you are familiar with the work of Albertsson, in Tiselius's laboratory, upon the fractionation of biological particles and macromolecules upon the basis of partition between two aqueous phases. In case you have not seen Albertsson's latest work, or have not considered its applicability to the problem, I am enclosing a copy of an annual report from the Uppsala laboratory dealing with work done under contract with the U. S. Department of the Army. It is not necessary to return this report, but I ought perhaps to mention that the contents have not yet appeared in the open literature, and that for this reason they should not be quoted without the knowledge of Professor Tiselius.

Yours sincerely,

J. B. Bateman

J. B. Bateman
Biophysical Research Branch
Physical Sciences Division

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Cy to Dr. Housewright
Dr. Wagman